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E-COMMERCE USAGE IMPACT ON INDIVIDUAL WELL-BEING: EXPLORING EFFECTS AND MECHANISMS

Ana Isabel da Silva Resende

Dissertation

presented as partial requirement for obtaining the Master Degree Program in Data Science and Advanced Analytics

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Instituto Superior de Estatística e Gestão de Informação

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by

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Dissertation presented as partial requirement for obtaining the Master's degree in Data Science and Advanced Analytics, with a Specialization in Business Analytics

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February 2024

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledge the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisbon, February 27th, 2024

ABSTRACT

E-commerce is a growing reality that brought innovation to the way we shop. Its adoption is scaling with time and with the growth comes new and more revolutionary ways to improve user experience. Since the adoption of new technologies has a direct impact on well-being, the study of e-commerce usage impact on consumer well-being is crucial. Based on data collected from 164 users, we apply the Expectation-Confirmation Model to understand the well-being that results from e-commerce platform usage. We find that perceived usefulness impacts on well-being and perceived privacy mediates the relationship between perceived usefulness and well-being.

KEYWORDS

E-commerce; well-being; ECM

INDEX

1. Introduction	1
2. Literature Review	3
2.1. E-commerce and Well-Being	3
2.2. Expectation-Confirmation Model	4
3. Research Model and Hypothesis	6
4. Method	9
4.1. Measurement	9
4.2. Data	9
5. Results.....	11
5.1. Measurement Model.....	11
5.2. Structural Model.....	12
6. discussion.....	13
6.1. Theoretical Implications	14
6.2. Practical Implications.....	15
6.3. Limitations and Future Studies.....	16
7. Conclusion	18
8. References	19
Appendix.....	24

LIST OF FIGURES

Figure 2.1 – Expectation-Confirmation Model (ECM)	4
Figure 3.1 – Research Model	6

LIST OF TABLES

Table 4.1 – Sample characteristics (n = 164).....	10
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1. INTRODUCTION

In recent years, electronic commerce has been experiencing continuous growth, revolutionizing the way people interact with businesses. Alongside the continuous changes in e-commerce practices, the need to better understand users' retrieved well-being from these platforms grows. Quoting Kumar (2021), "As a symbol of globalization, E-commerce represents the cutting edge of success in this digital age, and it has changed and is still changing the way business is conducted around the world". The growth of e-commerce around the world is clear. According to Gherghina et al. (2021), Western Europe has the most developed e-commerce market among the 27 countries of Europe. In other parts of the world, the same pattern has been observed, and its impact on daily life has been described as a pioneer in business organizations nowadays (Al-Ayed, 2022) In a similar vein, the digitalization of the world as we know it has created a new way of facing the world and ourselves, impacting our overall well-being. New concepts have emerged, such as digital well-being that according to Gui et al. (2017) is the ability to deal with large amounts of information as well as the considerable amount of choices we make regarding our social interactions. Well-being is a hot topic as many believe digitalization will compromise it and others agree it will be potentiated.

A lot has been written about e-commerce and well-being. Rita et al. (2019) wrote about how the services provided affect the behavior and satisfaction of customers in shopping online and Mcknight et al. (2002) published the impact of customers' initial trust in the intention to shop on a website. Aparicio et al. (2021) showed trust can positively impact the intention of using e-commerce, the frequency associated with it, and the repurchase intention. Further, trust plays an important role in the e-commerce context, and overall quality is also a key dimension to explain both use and user satisfaction with e-commerce (Tam, Loureiro, et al., 2020). The perceived security and privacy of a user from an e-commerce platform can impact user interactions. Saeed (2023) demonstrated the vital role of trust and positive security perception for e-commerce growth through adoption. Digital literacy can be an important aspect of e-commerce usage Azizah et al., (2023) and Suryani et al. (2022) claim that the adoption of e-commerce rises with increasing levels of digital literacy. Alibasa et al. (2019) have studied the relationship between digital usage and the user's mood, aligning with previous studies on mood improvement after social networking exposure or gaming experience. Having this information and considering the existing gap in the literature, this study will focus on the following research question (RQ):

RQ: Can users' well-being be influenced by the usage of e-commerce platforms?

This study aims to investigate the well-being retrieved by e-commerce platforms and the factors that potentiate positive or negative well-being. The expectation-confirmation model (ECM) (Bhattacharjee, 2001b) is the model to apply as it can be used to study customer attitudes and behaviors in e-commerce businesses as well as to confirm expectations. Additionally, we will add the digital literacy variable into the study to further analyze the impact of this variable on users' well-being. This is intimately connected with other e-commerce variables, thus an ECM variation will be created and tested in this research.

This paper contributes to the theory by proposing a research model that is a variation of ECM, combining the traditional variables with well-being, but also a new model by including digital literacy that is not usually used and combined in e-commerce studies. Therefore, this research contributes to

further extend the ECM explanation capabilities by adding new variables, but also to increase the knowledge on well-being that results from e-commerce usage. Our study explores the relationship between trust and perceived privacy and e-commerce well-being. People's beliefs and behaviors may be explained by the relationship between trust and perceived privacy and e-commerce well-being.

In the following section will be presented the literature review, to give a theoretical overview of the topic. Section 3 presents the explanation of the research model and the hypothesis. Follows section 4 containing the explanation of the methodology and the corresponding results. The last sections, 5 and 6, expose the discussion and conclusions of the topic. Note that in this study we use “user” and “customer” interchangeably to refer to online buyers.

2. LITERATURE REVIEW

2.1. E-COMMERCE AND WELL-BEING

Nowadays, technology is an omnipresent force that influences the way we live. With its constant advances, most of the personal and professional tasks carried out daily become easier. As a direct consequence of these improvements, well-being starts to play an important role in the equation as it can be profoundly influenced. Therefore, the relationship between technology and well-being has become of major importance to the scientific community that continues to study this intersection to better understand its nuances and effects.

E-commerce has grown significantly in Portugal, as more businesses are getting involved in the trend. According to a report in Observador (2023), the covid-19 pandemic has increased the revenue growth seen in the Portuguese e-commerce business since 2017. 62% of Portuguese businesses have an online presence but only 16% of Portuguese businesses, according to the survey, have an online sales channel. According to the mentioned article, it is predicted that the Portuguese e-commerce market will be worth 7.130 million euros in 2023 considering the growth stated. The article points to security and data privacy as vital variables when considering e-commerce usage. According to RASI (2023), an annual report on internal security and crime in Portugal, cybercrime has been growing over the years, and from 2021 to 2022 there was an increase of 48,7% in cybercrime notifications. Given the crime recorded, variables such as trust, risk, and privacy are factors for improvement by businesses due to their great impact on consumers' perceptions and consequently well-being.

A lot has been written about the topic. For example, Maseeh et al. (2021) wrote about consumer privacy by doing a meta-analysis synthesizing the existing literature regarding consumer privacy concluding that risk perceptions have a direct impact on privacy concerns and benefit perceptions, familiarity, reputation, privacy policy, and trust have an impact on consumers' usage of digital platforms and their attitude about them. Regarding customers' behavior and satisfaction in online shopping, Rita et al. (2019) elaborate that the online service quality is statistically related to the consumers' behavior. This e-service quality is impacted by three dimensions such as the design of the website, its privacy, and fulfilment. These results came from the application of SEM (Structured Equation Modelling) over data collected in a survey. We can also point out Purwanto (2022) who concluded that satisfaction reflects a positive effect from digital leadership and quality, and consequently impacts in positive way users' loyalty. The impact of the initial level of customers' trust on the intention to transact with a website was approached by Mcknight et al. (2002), using trust building model (TBM), which discovered that both the quality and reputation of the website in question are powerful tools that impact positively the consumers trust while internet perceived risks will affect negatively. Suryani et al. (2022) have focused on digital literacy and its side effects on SMEs concluding that higher levels of digital literacy contribute positively to e-commerce adoption and can even improve business performance. Olsen et al. (2022) researched consumer well-being by examining whether and how self-esteem and life satisfaction relate to online impulsive buying tendency (IBT) and compulsive buying tendency (CBT). The study used SEM to analyze survey data and concluded that negative self-esteem potentiates both IBT and CBT, keeping in mind that the study considers IBT as a form of shopping well-being and therefore contributes to overall quality of life, while CBT is considered a form of shopping ill-being. Kang & Shao (2023) analyzed the impact of voice assistants' intelligent attributes on consumers' well-being, concluding that these attributes impact perceived consequences

and subsequently subjective well-being. Additionally, it is claimed that effective interaction between voice assistants and users might boost users' satisfaction regarding their basic needs, hence raising their subjective well-being. The link between smart tourism technologies and tourists' psychological well-being has also been studied (Gani et al., 2023). Different variables were included in the study such as automation, information accuracy, personalization, security concern, perceived benefit, and growth mindset. The outcome was reached through the application of partial least square - structural equation modeling (PLS-SEM) and stated that perceived benefit has a great impact on psychological well-being and this relationship is moderated by tourists' growth attitude, meaning that higher growth mentality people will be more confident in their ability to take advantage of the benefits for their psychological health.

To the best of our knowledge, we couldn't find studies explaining the well-being that derives from the diverse factors of e-commerce usage applying ECM. Therefore, the focus of this study is to further analyze this topic.

2.2. EXPECTATION-CONFIRMATION MODEL

The expectation-confirmation theory (ECT) was first introduced by Oliver, in 1980. This theory aimed to explain the relationship between expectation, disconfirmation, satisfaction, and attitude and purchase intention (Oliver, 1980). However, the ECM as it is used nowadays is a result of Bhattacharjee's contributions, who introduced this theory to the Information Systems (IS) literature later in 2001. Bhattacharjee understood the potential for the model to be applied in post-adoption technology systems use and expanded its dimensions to incorporate new variables such as confirmation. This model is built on the basic idea that consumers form expectations before using a service or product and those expectations result from external influences such as advertising campaigns, previous experiences, or word-of-mouth feedback. The importance of perceived usefulness and perceived simplicity of use in influencing expectations and subsequent confirmation or disconfirmation was highlighted in Bhattacharjee's contributions Bhattacharjee (2001b). These new dimensions in ECM have proved to be quite useful as the model continuously gains support across several domains, including e-commerce. In Figure 2.1 we can see a visual representation of ECM, where the impacts between dimensions are well characterized. Given its versatility, the model can be extended to incorporate new dimensions and complexities, which contributes to its continued relevance and application in analyzing consumer behavior.

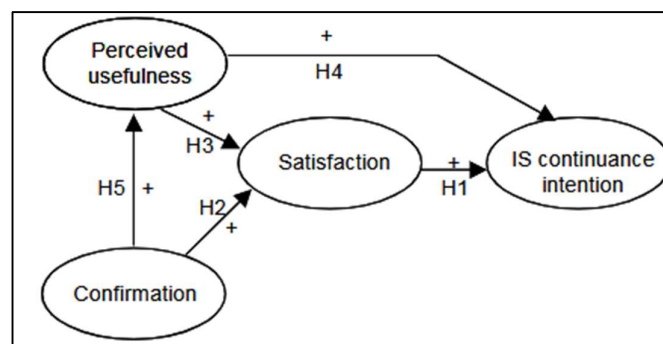


Figure 2.1 – Expectation-Confirmation Model (ECM)

When analyzing the literature involving this theory, it is possible to get a broader overview of its adaptability to different areas as well as its capability to join other known theories. Hariguna et al. (2023) studied e-government services and how their quality influences public behavior intention by including the e-government quality in the expectation-confirmation model. ECM has also been used to explain the continuance usage intention of travel applications (Y. Liu et al., 2023) as well as the continuance usage intention of virtual classrooms during the covid-19 pandemic (Huang & Zhi, 2023). M-commerce or mobile commerce is one of the main contexts in which ECM is used. To explain the continued use of m-payments in an African context, Franque et al. (2022) used this model combined with the task technology fit model and the trust dimension, concluding that use, individual performance, satisfaction, and overall trust are the key constructs of the study. Still in m-commerce, there have been studies exploring the effects that better impact the continued usage of these type of apps (Wen et al., 2022) and some others regarding the moderating impact of culture and user types (Chauhan et al., 2022). ECM adaptability can also be seen by its application into Chen & Wu (2023) research that aims to understand the impact of electronic word-of-mouth and reputation in e-commerce, and how businesses manage it. This theory is not only used for technology related studies but also for current day situations as Minh Ngoc et al. (2023) proved by applying it to explore the continuance usage intention of electric motorcycles among students in Hanoi. The study concluded that perceived usefulness and satisfaction have a positive influence on the intention to continue using electric motorcycles. Additionally, perceived ease of use and expectation confirmation indirectly affect this intention, while the first two factors have a direct effect.

ECM has been widely used to understand the numerous aspects of consumer behavior and satisfaction, which can be indirectly related to well-being. However, its use applied directly to the variable well-being is yet to be further analyzed. Given its ability of better understand the overall consumer behavior, it is going to be applied to study the direct impact of variables like satisfaction, trust, confirmation, perceived privacy or usefulness on well-being.

3. RESEARCH MODEL AND HYPOTHESIS

E-commerce and well-being represent a relationship that hasn't been deeply studied, being the focus of this study. The proposed research model, presented in Figure 3.1, addresses the main factors that can directly or indirectly affect users' well-being. The model asserts that:

- Digital literacy directly impacts users' perceived usefulness of e-commerce and confirmation.
- Perceived usefulness can have a direct or indirect impact on a user's well-being and satisfaction.
- Confirmation determines perceived usefulness and satisfaction.
- Perceived privacy and trust moderate the impact of satisfaction and perceived usefulness on the user's well-being.
- Age, gender, education and occupation are used as control variables in the model.

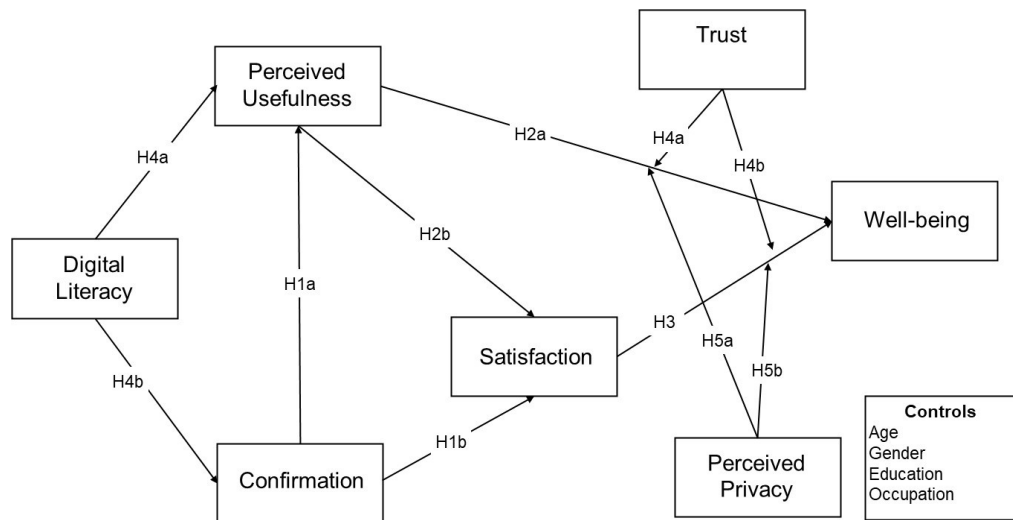


Figure 3.1 – Research Model

According to Bhattacharjee (2001b), confirmation is the process by which people assess and reaffirm their preconceived expectations regarding a specific good or service. Therefore, confirmation occurs when the individual experience and/or interaction with the product is aligned with the previous expectations about it, confirming and reinforcing previous beliefs. The same study shows a positive impact of confirmation on both perceived usefulness and satisfaction, as well as many other research articles on the most diverse topics such as mobile apps (Tam, Santos, et al., 2020), carbon footprint calculators (Lin, 2017), or even AI-based text-to-image (Y. L. E. Liu & Huang, 2024). Accordingly, the following hypotheses were defined:

H1a: User's confirmation (C) has a positive impact on perceived usefulness (PU).

H1b: User's confirmation (C) has a positive impact on satisfaction (S).

Perceived usefulness is commonly associated with the technology acceptance model (TAM) and refers to a person's assessment of how a particular technology or system might improve their productivity or ease their life (Fred D. Davis, 1989). The perceived usefulness of an information system use was

identified in Bhattacharjee's study (2001b) to be associated with positive user satisfaction. The same impact has been demonstrated by Correia & Tam (2024) in a mobile Apps context. Given the comprehensiveness of the topic, we believe that the same outcome can be expected when approaching individuals' well-being. Therefore, we hypothesize the following:

H2a: Perceived usefulness (PU) has a positive impact on well-being (WB).

H2b: Perceived usefulness (PU) has a positive impact on e-commerce satisfaction (S).

Satisfaction is described by Bhattacharjee (2001a) as how someone considers whether a situation, product, or service meets their expectations or not. Thus, we can state that satisfaction will be the outcome of an experience in which the previous expectations were met or surpassed. Satisfaction has been widely included in research articles playing an important role in the explanation of outcome variables. The study mentioned before pointed to a positive impact on the information system continuance intention, but many others can be mentioned. Satisfaction has a positive effect on individual performance (Tam, Santos, et al., 2020), customers' loyalty (Purwanto, 2022) or even on usage continuance intention of mobile health services (Nie et al., 2023). We expect satisfaction to have a positive impact on well-being. Therefore, we hypothesize:

H3: Satisfaction (S) has a positive impact on well-being (WB).

Trust is an important element in the ECM as it influences the user's perceptions and interpretations of a product or service's experience. Moreover, trust not only plays a relevant role in the perception side of the equation but also the continued engagement with the product or service. Regarding the relationship between perceived usefulness and trust, these are variables that commonly appear together, the second one majorly impacted by the first (Bimaruci et al., 2020; Pramananda et al., 2020). When investigating the antecedents of e-commerce satisfaction in a social commerce context, Attar et al. (2021) demonstrated that trust directly impacts user satisfaction. In the same line and amongst many other research articles, (Tam, Loureiro, et al., 2020) proved that overall trust positively influences user satisfaction, while studying individual performance. Keeping this background in mind, we propose the following hypotheses:

H4a: Trust (T) has a positive moderating effect on the impact of perceived usefulness (PU) on Well-Being (WB).

H4b: Trust (T) has a positive moderating effect on the impact of satisfaction (S) on well-being (WB).

Similarly to trust, perceived privacy plays a crucial and indirect role in ECM as private expectations can impact initial expectations and even the user experience. If for some reason some privacy concern is violated or met while using a product or service, the overall satisfaction and consequent usage can be affected. The relationship between perceived privacy and perceived usefulness is explicated in some research articles, for example in the study of social networking websites where perceived privacy moderates the effect of perceived usefulness on users' continuance intention (Tan et al., 2012). Purchasing behavior may also be influenced by perceived privacy in other domains (Putri et al., 2024). We posit:

H5a: Perceived privacy (PP) has a positive moderating effect on the impact of perceived usefulness (PU) on well-being (WB).

H5b: Perceived privacy (PP) has a positive moderating effect on the impact of satisfaction (S) on well-being (WB).

The skills, knowledge, and abilities needed to efficiently navigate, use, comprehend, and critically assess digital devices, technologies, and information are collectively referred to as digital literacy. According to Nazzal et al. (2021), digital literacy has a direct impact on perceived usefulness and this impact is significant. In the mentioned study, both variables are of high importance in the intention to shop online. Faheem Akram et al. (2023) also state a direct relationship between digital literacy and perceived usefulness while studying the role of digital literacy in consumer behavioral intentions. Regarding the relationship between digital literacy and confirmation, there are not many studies that connect these variables. However, we believe digital literacy can significantly impact confirmation behavior as confirmation reflects the validation users look for when engaging in online purchases and if the level of digital literacy is considerable then the evaluation of the information provided, the navigational ease, and even the trust in the online platform will be better.

H6a: Digital literacy (DL) has a positive impact on perceived usefulness (PU) of e-commerce.

H6b: Digital literacy (DL) has a positive impact on confirmation (C).

In this study, several control variables have been identified and incorporated to mitigate potential confounding effects. Age, gender, education level, and e-commerce experience are considered as control variables due to their potential influence on the relationship between well-being and the remaining variables. To improve the accuracy and dependability of our hypothesis testing, we attempt to isolate the true impact of the independent variables on the dependent variable by adjusting for various demographic and socioeconomic aspects.

4. METHOD

4.1. MEASUREMENT

Data were collected by a survey aiming to test the proposed research model. Every construct item was derived from reputable research that can be found in the literature. Measurement items for perceived usefulness (PU) and confirmation (C) were adapted from Bhattacharjee (2001b). Satisfaction (S) items were taken from Bhattacharjee (2001b) and Yan et al. (2021). The items related to trust (T) were collected from Falahat et al. (2019) research study. Validated items for digital literacy (DL) were adapted from Nikou et al. (2022) and perceived privacy (PP) construct items are based on Tseng (2022). Concerning the dependent variable, well-being (WB), the validated items were inspired from Kang & Shao (2023). Appendix A contains a list of all the measuring items for each construct along with the relevant literature sources.

Every item was placed on a seven-point range scale that had already been validated, with anchors that went from strongly disagree (1) to strongly agree (7). English and Portuguese versions of the questionnaire were created utilizing an online survey tool provided by qualtrics.com.

4.2. DATA

A pilot survey was conducted to test if the selected construct items that were chosen to develop the questionnaire were valid, and this was sent to a small sample of the population. It was necessary to define the word "e-commerce" and the current study's objective to collect the greatest number of replies. The survey was widely distributed the week following the pilot since the first 32 complete replies were satisfactorily tested, and therefore no questions were removed from the survey. With the goal of a broad sample, the survey was answered by distinct society groups, meaning that several education levels were reached as well as different e-commerce experiences. The questionnaire was distributed using several platforms including social media (Instagram, LinkedIn) and e-mail, resulting in a total of 164 responses. No responses were excluded from the study as all of them were completed. Unfortunately, given the distribution of the survey, it is not possible to compute a response rate. Common method bias was checked with the help of Harman's single-factor technique assessing whether a single dominant factor could explain the variance in measured variables (Podsakoff et al., 2003). It has been acknowledged that this methodological technique can be used to address prevalent method bias in research projects (Malhotra et al., 2006; Podsakoff et al., 2003). The observed variance of 41% in the dataset shows no significant common method bias, as it falls into the acceptable values for this technique.

The final sample, as shown in Table 4.1, is made up of 164 people: 70 men (43%), and 94 women (57%). Most of the participants have less than 31 years, representing 37% of the sample. The range with age above 50 is also dominant (26%), meaning that the sample contains 37% of respondents with age between 31 and 50. In terms of the greatest degree attained, most respondents had a degree lower than bachelor's (47%), followed by bachelor's (31%) degree, and after respondents with master's degree or higher (22%). E-commerce experience was also included in the survey and the majority of the participants, specifically 70 (43%), have more than 5 years of experience. Only 19 (11%) of the respondents have less than 1 year of experience and with 1 to 3 years of experience we have 36 (22%) respondents and with 3 to 5 years 39 participants (24%).

Table 4.1 – Sample characteristics (n = 164).

Gender		Age		Education		E-commerce experience	
Female	94 (57%)	<31	60 (37%)	Lower than a bachelor's degree	77 (47%)	Less than 1 year	19 (11%)
						1 to 3 years	36 (22%)
Male	70 (43%)	31-40	29 (18%)	Bachelor	50 (31%)	3 to 5 years	39 (24%)
		41-50	32 (19%)	Master's degree or higher	37 (22%)	More than 5 years	70 (43%)
		>50	43 (26%)				

5. RESULTS

To perform the data analysis, we applied structural equation modeling (SEM). According to F. Hair Jr et al. (2014), when using PLS-SEM, a sample must be at least ten times more extensive than the maximum number of inner model parameters in the structural model. Given the collected sample size is within the proposed range, PLS-SEM was applied in the study. PLS-SEM combines both structural and measurement models, meaning it allows factor analysis to be integrated with hypothesis testing in a single operation and enables measurement errors of the observed variables to be examined as an essential component of the model (Gefen et al., 2000).

5.1. MEASUREMENT MODEL

To guarantee an adequate fit, the consistency and dependability of the research instrument were verified. Cronbach's alpha is the traditional criterion to ensure internal consistency, providing a reliability assessment according to the observed indicator variables' intercorrelations. According to Hair et al. (2016), the use of composite reliability, an alternate internal consistency reliability measure, is advised due to the limitations of Cronbach's alpha when applied to the population. To assess PLS internal consistency, we verified if the composite reliability (CR) and Cronbach's alpha (CA) of all the constructs have a value above 0.7. The model has strong internal consistency since the CR scores are greater than 0.8, which is the upper bound of internal consistency reliability (Hair et al., 2016). Regarding the lowest bound of internal consistency dependability, we considered CA coefficient values. Considering Fornell & Larcker (1981) and Hair et al. (2009) research, if alpha coefficients are between 0.7 and 0.8, they can be considered acceptable, if they present values above 0.8 they are seen as good coefficients, and if the value is bigger than 0.9 they become excellent coefficients. Table 2 shows the alpha coefficients for each construct and as we can see all of them present values higher than 0.9.

Table 5.1 - Means, standard deviations, correlations, and reliability and validity measures (CR, CA, and AVE) of latent variables.

	Mean	SD	CR	CA	C	PU	S	DL	T	PP	WB
C	5.220	1.179	0.938	0.901	0.913						
PU	5.201	1.258	0.951	0.931	0.688	0.910					
S	5.497	1.106	0.950	0.930	0.761	0.737	0.909				
DL	5.386	1.218	0.943	0.909	0.335	0.446	0.348	0.921			
T	4.977	1.103	0.940	0.920	0.682	0.747	0.708	0.440	0.870		
PP	5.231	1.464	0.941	0.926	0.000	-0.009	-0.038	0.201	-0.089	0.894	
WB	4.385	1.454	0.943	0.925	0.632	0.691	0.604	0.438	0.626	-0.101	0.877

We first looked at loadings and cross-loadings to evaluate discriminant validity. Every loading displayed higher values than the matching cross-loadings (check Appendix B). Given the values in diagonal (bold) are the average variance extracted (AVE) square root, we proceed to evaluate if the square root of AVE is higher than the correlation between the constructs (Fornell & Larcker, 1981). As shown in Table 5.1, the correlations between constructs are lower than the AVE square root. The final criteria used to assess discriminant validity was the Hererotrait-Monotrait (HTMT) ratio correlations that presented values inferior to 0.9, as shown in Appendix C (Henseler et al., 2015).

5.2. STRUCTURAL MODEL

Before evaluating the structural model, there was the need to test the constructs multicollinearity, which can be considered as threat to the design model (Farrar D. E. & Glauber R. R., 1967). The variance inflation factor (VIF) was computed for this purpose. The results showed a result lower than 5, concluding there is no multicollinearity problem.

According to the PLS-SEM approach, the structural paths need to be assessed to test research hypotheses once the measurement model's validity has been established. A model including bootstrapping T-statistics was executed using 5,000 replicates to determine path coefficients and assess the viability of the hypothesized model (F. Hair Jr et al., 2014). Figure 5.1 presents the results of the performed test in the previously mentioned structural model. The coefficients in the model translate the results.

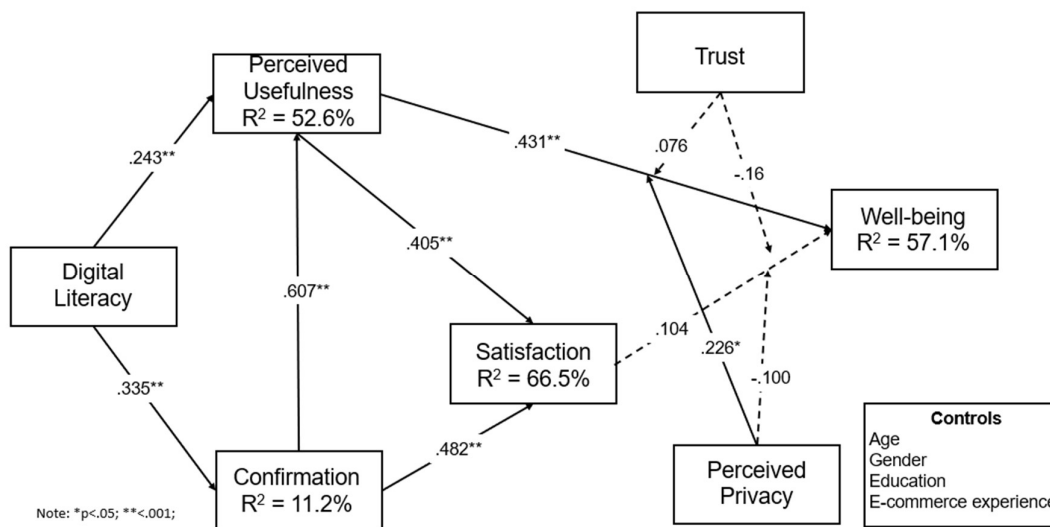


Figure 5.1. Research Model Results

The model explains 11.2% of the confirmation of e-commerce. Digital literacy ($\hat{\beta} = 0.335$, $p < 0.001$) is statistically significant in explaining confirmation, which supports hypothesis H6b. The model explains 52.6% of the perceived usefulness. Digital Literacy ($\hat{\beta} = 0.243$, $p < 0.001$) and confirmation ($\hat{\beta} = 0.607$, $p < 0.001$) are statistically significant in explaining the perceived usefulness, which endorses hypothesis H6a and H1a. E-commerce satisfaction is explained in 66.5% of variation. Confirmation ($\hat{\beta} = 0.482$, $p < 0.001$) and perceived usefulness ($\hat{\beta} = 0.405$, $p < 0.001$) are statistically significant in explaining satisfaction, which advocates for hypothesis H1b and H2b. Finally, the model explains 57.1% of e-commerce well-being. Satisfaction is not statistically significant in explaining e-commerce well-being, not supporting hypothesis H3. Perceived usefulness ($\hat{\beta} = 0.431$, $p < 0.001$) is statistically significant in explaining well-being, validating hypothesis H2a. Focusing on the moderating effects, perceived privacy ($\hat{\beta} = 0.226$, $p < 0.05$) has a statistically significant moderating effect on the impact of perceived usefulness on e-commerce well-being, which supports hypothesis H5a. None of the control variables revealed to be statistically significant. In conclusion, from a total of 11 hypotheses, 7 are supported and 4 others are not supported.

6. DISCUSSION

To the best of our knowledge, the well-being derived from using an e-commerce platform has not been previously studied, thus this is the first research on the topic. We have investigated several hypotheses related to the suggested model using an ECM variation, and the results show that the proposed hypotheses have overall favorable statistical support, 7 of 11 hypotheses are supported.

The model explains 11.2% of e-commerce confirmation. This result supports our hypotheses validating that the digital literacy of the users will impact positively the e-commerce confirmation. The perceived usefulness of e-commerce platforms is explained in 52.6% by the model. This result comes from the direct impact of digital literacy and confirmation and is supported by several studies (Faheem Akram et al., 2023; Lin, 2017; Nazzal et al., 2021; Tam, Santos, et al., 2020). Satisfaction retrieved from e-commerce use is explained in 66.5% of the model from the direct impact of confirmation and perceived usefulness. Confirmation impact on satisfaction can be supported by some comparable studies such as Tam, Santos, et al. (2020). The direct impact of perceived usefulness in e-commerce satisfaction is also aligned with the literature (Bhattacharjee, 2001b; Ogbanufe & Gerhart, 2018). In the proposed model, well-being is directly affected by perceived usefulness and satisfaction. Perceived usefulness factually impacts well-being, but satisfaction is not relevant as a direct impact on e-commerce retrieved well-being. Satisfaction is therefore against the comparable studies (Nie et al., 2023; Purwanto, 2022; Tam, Santos, et al., 2020). The impact of perceived usefulness and satisfaction on well-being has moderating effects from variables such as trust and perceived privacy. The impact of trust in both cases has proven to be not relevant for explaining well-being. This is against the literature as trust has been associated with positive moderating effects on the impact of perceived usefulness and satisfaction on well-being (Attar et al., 2021; Bimaruci et al., 2020; Pramananda et al., 2020; Tam, Loureiro, et al., 2020). Perceived privacy has proven to have a significant moderating effect on the impact of perceived usefulness on well-being but not on the impact of satisfaction on well-being. Thus, perceived privacy is of major importance when talking about this impact, as it is described in the literature (Tan et al., 2012). Given our results, we assume that the consequent well-being resulting from the use of e-commerce activities increases when the utility perceived by the users is higher.

This research adds to the subject of e-commerce and has broad theoretical and practical ramifications for marketing and IS/IT strategies.

Table 6.1 – Parameters estimates, hypotheses, and R²

Hypotheses	Dependent variable	B	Hypotheses test	R ²
	Confirmation			11,20%
H6b: DL -> C		0.335**	supported	
	Perceived Usefulness			52,6%
H6a: DL -> PU		0.243**	supported	
H1a: C -> PU		0.607**	supported	
	Satisfaction			66,50%
H2b: PU -> S		0.405**	supported	
H1b: C -> S		0.482**	supported	
	Well-Being			57,10%
H2a: PU -> WB		0.431**	supported	
H3: S -> WB		0.104	not supported	

Legend: DL - Digital Literacy; C - Confirmation; PU - Perceived Usefulness; S - Satisfaction; WB -Well-Being
Note: **p<0.001

6.1. THEORETICAL IMPLICATIONS

The main theoretical contribution we have is the proposed model. This model has a variation when compared to the usual e-commerce-related models and even ECM, adding the well-being variable. Besides well-being, the model also introduces digital literacy to understand its impact on Perceived usefulness and confirmation. With the model in question, we attempted to prove the main variables leading to well-being when using e-commerce platforms. To the best of our knowledge, no prior research approached this relationship between e-commerce and well-being.

The results suggest that ECM key variables and their interactions remain consistent although the impacts' magnitude may change. Perceived usefulness and confirmation continue to play a fundamental role in the analysis of e-commerce usage. The introduction of variables like digital literacy has expanded our analytical scope, providing a fresh perspective on how e-commerce is approached. This analysis explains further the perception of utility and the respective confirmation regarding a specific platform. According to the results, e-commerce platforms can expect that individuals with high levels of digital literacy will face their businesses differently. These individuals are more likely to find these platforms more useful and consequently reinforce their expectations and beliefs.

When evaluating trust results, we can see that they are not statistically validated and therefore not supporting what was hypothesized. This is a fact that contradicts literature such as Tam, Loureiro, et al. (2020) that clearly states the importance of trust not only regarding the utility a platform provides but also the satisfaction users get from its usage. This may be due to the increasing adoption of e-commerce platforms, potentiated by many factors but mainly by the COVID-19 pandemic. The peak of e-commerce activity usage has been reached and this marks a new paradigm in terms of users' perspective about these platforms. Trust was a major barrier in the early days of e-commerce because the platforms were unproven and not prepared to deal with specific problems. However, customers are now considering these websites as reliable due to improved security against online threats and more sophisticated technologies. It's interesting to note that trust appears to be less of a deal-breaker for customers when making decisions today as trust appears to be more embedded in the platform itself.

Satisfaction, alongside trust, doesn't find strong support in the data. This contradicts previous research (Nie et al., 2023; Tam, Loureiro, et al., 2020) that highlighted satisfaction as a critical component favorably impacting e-commerce usage and, as a result, the well-being obtained from it. Facing this new information, we can assure e-commerce landscape is changing over time. Satisfaction would be a key player in explaining e-commerce adoption, especially when e-commerce platforms started to appear. Nowadays, people view satisfaction as a prerequisite for using e-commerce. It leads us to the conclusion that given the great exposure customers face to e-commerce platforms, the satisfaction retrieved from them is no longer the primary consideration. Instead, utility seems to be the key to this new era of online shopping.

Under the guidelines of Jeremy Dawson's conceptual framework, we used an analytical technique that emphasizes the need to investigate interaction effects to reveal the complex relationships between variables (Aiken & West, 1991; Dawson, 2014; Dawson & Richter, 2006). We explore the complex relationships between perceived usefulness (PU) and its moderating effect of perceived privacy (PP) in the context of our study on user well-being retrieved from e-commerce adoption. The model's values are derived through an examination of the gathered data. First, we look at the primary effects and as a moderator, PP is linked to a coefficient of -0.101, whereas PU has a value of 0.431. These numbers show how each variable affects the overall well-being of individuals engaging in e-commerce platforms. But when we examine the interaction effects, it becomes clearer the relationship between these variables. With a value of 0.226, the interaction term indicates that not all levels of perceived privacy have the same impact on e-commerce well-being due to perceived usefulness (Figure 6.1.1). The perceived privacy moderator suggests major impact of high perceived usefulness on well-being when the user has high perceived privacy. For user with low perceived privacy, the perceived usefulness is not important in explaining the e-commerce well-being.

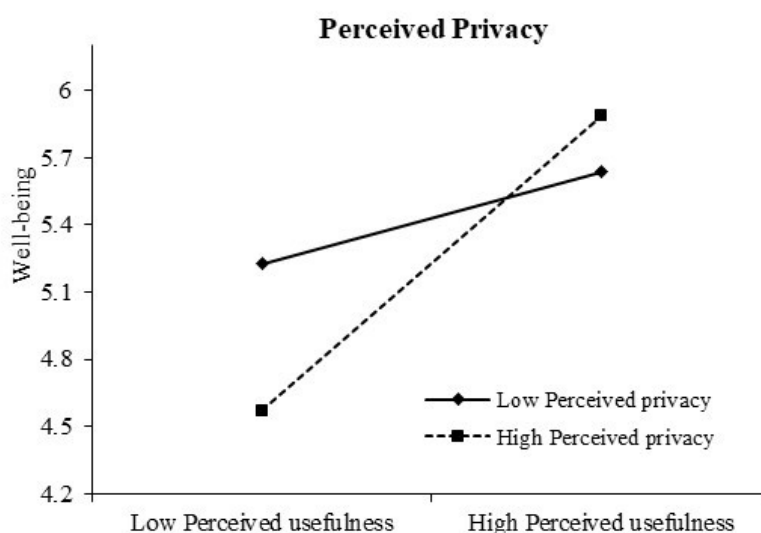


Figure 6.1.1 - Moderator Effect of Perceived Privacy on Perceived Usefulness

6.2. PRACTICAL IMPLICATIONS

We believe that decision-makers, hoping to improve the information systems' performance in the e-commerce industry, can benefit greatly from the insights provided by this study. The findings suggest that managers would gain from focusing especially on how perceived usefulness affects e-commerce customer happiness. Moreover, increasing the usage of e-commerce and the expectation of continuous use requires paying attention to how useful the platform is to its users.

The findings of this study highlight the importance of perceived usefulness as the most important variable in the e-commerce area. The well-being that a customer will retrieve from a platform usage is directly related to the utility a platform has to him. Although platform trust and satisfaction were key variables in the recent past, their role nowadays has changed, and they are now considered as inherent features of these activities. Utility should be the primary focus of e-commerce platform owners, as this will improve the business by attracting customers. Therefore, the managers of these platforms should

draw a framework in which all utility aspects are considered. For example, response time, payment methods, delivery and returns, refunds, price, and interface should be considered as relevant information on the products and services provided by the platform. The stated variables will set the way customers face the business and consequently the retrieved well-being.

Although trust and satisfaction are no longer primary aspects when approaching e-commerce topics, e-commerce activities should still be aware of these dimensions and adapt the platforms in a way that it does not have any implications for the users. Customers face e-commerce satisfaction as a pre-conceived idea, meaning they're already expecting to be satisfied by using a platform. However, it is very important to maintain a good business image to the users by keeping promises and a consistent quality of service/product. Trust is also faced differently nowadays, assuming that businesses are keeping up with the most recent and advanced technologies to prevent any digital threats. Nevertheless, e-commerce platforms should renew their security regularly to face the new updates in the cybernetics world and to keep their level of integrity and trustworthiness as high as possible.

One of the variations introduced in this model was the digital literacy of users, revealing that individuals with higher levels of digital literacy will face the business utility more positively. This is aligned with previous literature such as Faheem Akram et al. (2023) and Nazzal et al. (2021). This can be a good insight for the platform managers as they can expect that higher digital knowledge individuals can be a synonym for a better perception of business and even more loyal users if the utility of the platform is well perceived.

Concluding, managers should consider the aspects mentioned above, keeping in mind that perceived usefulness, satisfaction, trust, and digital literacy are points to look after. They now can adapt their business in a way that utility is the primary focus, but never discarding satisfaction and trust. We expect future researchers to consider this study to study deeper on the topic.

6.3. LIMITATIONS AND FUTURE STUDIES

It is important to recognize that there may be some limitations to the current study, even though it may have consequences for the context of e-commerce and its effects on well-being. The first restriction to point out is related to the sample used in this study. Most of the respondents in the sample, which was gathered in a short period, are from Portugal, which has lower rates of e-commerce use than other nations. It could be beneficial to include a more representative distribution of participants from different regions or nations with varying degrees of e-commerce adoption in future research to further diversify the sample. This more extensive sampling strategy might offer a more thorough understanding of e-commerce preferences and behaviors across various demographic groups, possibly improving the generalization of these findings to the outside of the Portuguese context. Furthermore, respondents did not indicate in the survey how frequently they use e-commerce, which may have an impact on the data that was gathered because the frequency of use or purchase was not assessed. On the other hand, e-commerce experience was considered in this study, revealing that most of the inquiries have more than 5 years of e-commerce usage experience, which can be a confirmation of a good sample in use. The results showed that the age range of the respondents was 19 to 65. Because of their opinions and preconceptions or because they are unfamiliar with e-commerce, the responses in both cases may be skewed. When comparing younger interviewees to older respondents, data may reveal disparities in their judgments of e-commerce platform performance and trust. This allows to adapt strategies according to each age group. The

results can be generalized as they allow to do so, however, it is good to have in mind they may have some issues regarding sample representativeness. The research design is another limitation to consider, as we are looking at a reality that is always evolving because of technological improvements. The industry is always expanding, introducing fresh advancements daily and gradually changing user behavior. With all these advancements, it is anticipated that perceptions will constantly shift, supporting the idea of a time-lagged approach to data gathering to provide a more comprehensive study regarding the impact of e-commerce use on well-being.

7. CONCLUSION

E-commerce growth is clear and with it, many other questions arise such as the well-being of its users. Technological progress and increasing adherence have accentuated these questions. Research on e-commerce and well-being is critical to have a more informed society but also for businesses to adapt their strategy to better fit customer needs and interests. We argue that perceived usefulness is the most relevant factor when approaching e-commerce well-being, but it is important to note that digital literacy also has a crucial role. Considering the literature regarding e-commerce, we developed a model inspired by the Expectation-Confirmation Model with the variation of digital literacy and also e-commerce well-being. The research model was tested based on a sample with 164 observations, most of them from Portugal. The model explains 57.1% of e-commerce well-being, due to perceived usefulness. Thus, to answer the proposed research question we can state that e-commerce well-being can be affected by the usefulness of e-commerce platforms. This study has some theoretical and practical implications as e-commerce has constant progress associated with it. The findings of this study are very relevant for e-commerce businesses to carefully analyze their strategy and redesign their systems. Some limitations were also pointed out.

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APPENDIX

Appendix A – Items

Constructs		Item	Source
Confirmation	CF1	My experience using e-commerce was better than what I expected.	Bhattacharjee (2001)
	CF2	The service level provided by e-commerce was better than I expected.	
	CF3	Overall, the majority of my expectations from using e-commerce were confirmed.	
Perceived Usefulness	PU1	Using e-commerce improves my performance in managing personal shopping.	Bhattacharjee (2001)
	PU2	Using e-commerce increases my productivity in managing personal shopping.	
	PU3	Using e-commerce enhances my effectiveness in managing personal shopping.	
	PU4	Overall, e-commerce is useful in managing personal shopping.	
Satisfaction	SAT1	I am very satisfied with e-commerce.	Bhattacharjee (2001)
	SAT2	I am very pleased to use e-commerce.	
	SAT3	I am satisfied with my decision to use e-commerce.	Yan et al. (2021)
	SAT4	I am satisfied with my previous experiences with e-commerce.	
Digital Literacy	DL1	I can learn new digital technologies easily.	Nikou et al. (2022)
	DL2	I know how to solve my own technical (ICT related) problems.	
	DL3	I have good digital technology skills.	
Trust	TR1	I believe e-commerce is trustworthy.	Falahat et al. (2019)
	TR2	I believe e-commerce provides reliable information.	
	TR3	I believe e-commerce keeps promises and commitments with customers.	

	TR4	I believe e-commerce behaviour keeps customers best interests in mind.	
	TR5	I believe e-commerce behaviour meets my expectations.	
Perceived Privacy	PP1	I am concerned e-commerce is collecting too much personal information about me.	Tseng (2022)
	PP2	I am worried that unknown third parties will access my personal information on e-commerce.	
	PP3	I suspect that my privacy is not well protected by e-commerce.	
	PP4	I am concerned about the privacy of the personal information that e-commerce captures about me.	
Well Being	WB1	Using e-commerce is part of my ideal life.	Kang & Shao (2023)
	WB2	I am satisfied with my life when I am using e-commerce.	
	WB3	So far, I have obtained the important things I want by using e-commerce.	
	WB4	E-commerce helps me to be optimistic towards my future.	Purohit et al. (2022)
	WB5	E-commerce help me to actively contribute to my happiness and well-being.	
Filters and Control	Age	Indicate your age	
	Gender	Indicate your gender	
	Education	Indicate your level of education	
	E-commerce experience	Indicate the years of experience and/or use of e-commerce	

Appendix B - PLS loadings and cross-loading

	Conf	PU	SAT	Dig	Trust	PPriv	WellBeing
CF1	0.928	0.598	0.681	0.280	0.586	-0.010	0.529
CF2	0.908	0.603	0.648	0.249	0.635	-0.040	0.633
CF3	0.904	0.677	0.746	0.377	0.645	0.043	0.571
PU1	0.623	0.920	0.692	0.447	0.687	-0.010	0.596
PU2	0.577	0.904	0.586	0.430	0.670	-0.024	0.665
PU3	0.634	0.925	0.655	0.379	0.665	-0.025	0.680
PU4	0.667	0.889	0.744	0.370	0.695	0.022	0.575
SAT1	0.694	0.643	0.926	0.310	0.633	-0.023	0.519
SAT2	0.652	0.654	0.908	0.326	0.611	-0.041	0.579
SAT3	0.665	0.658	0.917	0.308	0.607	-0.011	0.524
SAT4	0.749	0.720	0.887	0.320	0.715	-0.060	0.571
DL1	0.316	0.375	0.337	0.871	0.360	0.240	0.388
DL2	0.307	0.424	0.315	0.935	0.450	0.119	0.432
DL3	0.304	0.431	0.310	0.953	0.403	0.200	0.389
TR1	0.596	0.682	0.663	0.454	0.876	-0.023	0.497
TR2	0.563	0.698	0.647	0.431	0.875	-0.043	0.564
TR3	0.520	0.579	0.504	0.320	0.832	-0.062	0.490
TR4	0.557	0.582	0.543	0.281	0.866	-0.193	0.555
TR5	0.716	0.701	0.708	0.425	0.901	-0.062	0.603
PP1	0.134	0.036	0.110	0.171	0.057	0.803	-0.006
PP2	0.039	0.018	0.028	0.157	-0.015	0.906	-0.084
PP3	-0.043	-0.013	-0.082	0.173	-0.129	0.923	-0.101
PP4	0.002	-0.030	-0.050	0.223	-0.101	0.940	-0.098
WB1	0.560	0.662	0.584	0.409	0.541	-0.081	0.877
WB2	0.626	0.653	0.587	0.396	0.639	-0.052	0.896
WB3	0.554	0.592	0.526	0.352	0.504	-0.060	0.851
WB4	0.512	0.520	0.460	0.373	0.518	-0.152	0.886
WB5	0.502	0.586	0.472	0.387	0.528	-0.110	0.875

Appendix C - Heterotrait-monotrait ratio (HTMT)

	Conf	PU	SAT	Dig	Trust	PPriv	WellBeing
Conf							
PU	0.748						
SAT	0.825	0.789					
Dig	0.366	0.485	0.378				
Trust	0.744	0.806	0.759	0.480			
PPriv	0.073	0.045	0.083	0.220	0.097		
WellBeing	0.689	0.741	0.645	0.477	0.671	0.101	

Appendix D - Research Ethics

NOVA IMS | Ethics Committee - APPROVED

Qualtrics Survey Software <noreply@qemailserver.com>

ter, 20/02/2024 17:26

Para: Ana Isabel da Silva Resende <m20211018@novaims.unl.pt>

Não costuma receber e-mails de noreply@qemailserver.com. [Saiba por que motivo isto é importante](#)



This is to certify that

Project No.: **INFSYS2024-2-205973**

Project Title: **E-commerce usage impact on individual well-being: exploring effects and mechanisms**

Principal Researcher: **Ana Isabel da Silva Resende**

according to the regulations of the Ethics Committee of NOVA IMS and MagIC Research Center this project was considered to meet the requirements of the NOVA IMS Internal Review Board, being considered **APPROVED** on 2/20/2024.

It is the Principal Researcher's responsibility to ensure that all researchers and stakeholders associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Ethics Committee, via amendment or progress report, of

- Any significant change to the project and the reason for that change;
- Any unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role or any other change in research personnel involved in the project.

Lisbon, 2/20/2024

NOVA IMS Ethics Committee
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